



HAUTE AUTORITÉ DE SANTÉ

CLINICAL PRACTICE GUIDELINES

**Antibiotic therapy
and prevention of bacterial resistance
in healthcare organisations**

GUIDELINES

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1. Introduction

Ever since anti-infective agents were first used, the resistance of micro-organisms (not only bacteria, fungi and parasites but also viruses) to these drugs has continually increased. This increase has been particularly spectacular in the case of antibiotics in the last 20 years.

The prevalence of bacterial resistance to antibiotics in French healthcare organisations is a cause for concern. The choice of effective antibiotics is difficult and may be impossible for infections caused by totally resistant bacteria. Moreover, the number of antibiotics available has decreased as there are very few new drugs and supplies of the older ones are scarce. The prevalence of multiresistant bacteria and the severity of the infections they cause thus lead to widespread prescription of a limited number of active drugs (often the most recent and/or broad spectrum). France is one of the largest consumers of antibiotics in Europe. These practices facilitate the emergence of new resistances and lead to additional costs.

Account should be taken of the effects of antibiotic prescription not only on the patient's infection, but also on bacterial ecology and therefore on the community. It is essential to delay the appearance and/or extension of bacterial resistance and to preserve the activity of antibiotics for as long as possible.

The purpose of these guidelines is to ensure proper use of antibiotics, and in particular to facilitate the introduction by healthcare organisations of the most effective antibiotic strategies that will prevent the emergence of bacterial resistance. These guidelines update the ANAES¹ 1997 guidelines on "Proper use of antibiotics in hospitals".

They are based on a literature review, the regulatory provisions currently in force in France, and expert opinion. They are not ready-made protocols but contain useful prescribing rules and the key elements of a hospital's antibiotic policy. Each healthcare organisation should use these guidelines to implement a consensual antibiotic policy. All healthcare professionals, including managers, take a share of responsibility and therefore play a part in the proper use of antibiotics in the hospital.

These guidelines relate to proper use of antibiotics in hospitals and specify:

- provisions on the prescription of antibiotics;
- the role of institutional players (COMEDIMS², CAI³, and advisors);
- the role of non-institutional players;
- methods of information provision and training.

A companion document on standards for professional practice appraisal accompanies these guidelines. It is designed to facilitate guideline adoption and implementation by healthcare organisations.

2. Prescription of antibiotics

2.1 Organisation of antibiotic prescription in hospitals

These recommendations are designed to improve the quality of antibiotic prescriptions.

Antibiotics must be prescribed to a named person on a dated and legibly signed prescription form, stating the patient's name and the estimated administration period; the form is delivered to the pharmacy (Order of 31 March 1999). Prescriptions and dispensing must be

¹ ANAES: Former French National Agency for the Accreditation and Evaluation of Healthcare, incorporated into HAS.

² COMEDIS: *Commission des Médicaments et des Dispositifs Médicaux Stériles* (Committee for Medicinal Products and Sterile Medical Devices)

³ CAI: *Commission des Anti-Infectieux* (Anti-infection Agents Committee)

entered on computer for reasons of traceability and surveillance, and to analyse consumption.

A number of techniques can improve the initial choice of antibiotic treatment, especially when treatment combinations are used:

- drafting and applying readily accessible protocols based on guidelines, by type of infection,
- listing antibiotics that are reserved for certain indications and that are delivered subject to a written explanation such as simple clinical and/or bacteriological information (e.g. an antibiotic susceptibility profile);
- consulting the doctor in charge who may, if need be, validate the prescription of certain antibiotics;
- using prescription software for antibiotics with reminders, links to guidelines, information about bacterial resistance, and warnings that take account of the department's protocols and the patient's characteristics, in order to adjust treatment (withdrawal, de-escalation, maintained use of a combination of drugs, change of drug or method of administration, etc.).

A reassessment of the patient's condition has to be performed after 24 and before 72 hours to assess clinical course, obtain microbiological data, confirm (or refute) the presence of infection, and establish its bacterial nature. This reassessment is essential to proper antibiotic use, and especially of empirical antibiotic treatments.

The first prescription for empirical antibiotic treatment is limited to 3-4 days. The patient's condition and treatment need to be reassessed before treatment can be continued. Treatment continuation is subject to the opinion of a senior doctor (ward doctor, infectiologist or doctor in charge).

Particular attention must be paid to how long an antibiotic needs to be administered. For example, prescriptions with a limited duration may be used for certain indications (3 days in an empirical situation, 7 days for a documented indication) or for certain antibiotics (list drawn up by COMEDIMS⁴).

According to the literature, these techniques and procedures have a favourable impact on prescription practices. However, it is not known which procedures and techniques are the most effective, when used either alone or in association. Each CAI⁵ should therefore determine the strategy best suited to their local situation. It is also desirable to conduct research in this field.

2.2 Prescription procedures to prevent the emergence of resistant bacteria

The rules for antibiotic use must ensure that the emergence of resistant bacteria is limited, not only at the initial focus of infection but also in the commensal flora.

► Recommendations on curative antibiotic treatment

- Restrict antibiotic treatment to infections with a proven or probable bacterial origin and those for which other measures are inadequate.
- Comply with the appropriate dosage and administration mode for the given antibiotic and disease (administration route, loading dose, frequency, monodose or daily multidose, continuous perfusion, etc.) to ensure that appropriate drug levels are reached at the infection site. Take great care to avoid underdosage, which is a cause

⁴ COMEDIMS: *Commission des Médicaments et des Dispositifs Médicaux Stériles* (Committee for Medicinal Products and Sterile Medical Devices)

⁵ CAI: *Commission des Anit-Infectieux* (Anti-infection Agents Committee)

of treatment failure, and overdosage, which causes iatrogenic disorders. A serum assay of some drugs is useful (glycopeptides, aminoglycosides, and even other antibiotics).

- Choose the antibiotics that have the narrowest spectrum amongst a set of antibiotics with similar efficacy (except for neutropenic patients).
- Treat severe infections as soon as possible after the initial diagnosis and collection of samples for microbiology testing (during the first hour in septic shock patients).
- As a rule of thumb, do not treat for more than a week as many infections do not require longer treatment. Prolonged treatment exposes the patient to an unfavourable risk-benefit ratio (increased bacterial resistance and increased toxicity). Even shorter treatments have been validated in well-defined situations.
- Whenever possible, consider de-escalating or even discontinuing treatment in the light of clinical and microbiological data, and clinical assessment of the patient.

► Recommendations on combinations of antibiotics

Antibiotic monotherapy is sufficient for most infections.

Antibiotics may be combined to prevent the emergence of resistant bacteria at the infection site by rapidly reducing the bacterial inoculum, but this may increase selective pressure on the commensal flora. The prescription of combinations, except in the case of mycobacterial infections, must be strictly limited to the following well-defined situations:

- the need to broaden the antibacterial spectrum: severe infections which are not microbiologically documented;
- *Pseudomonas aeruginosa* infections;
- Bacteria/antibiotic pairs carrying a risk of emergence of resistance:
 - group 3 Enterobacteria (e.g. *Enterobacter*, *Serratia*, *Citrobacter freundii*, *Providencia*, *Morganella*) and third-generation cephalosporins,
 - *Staphylococcus aureus* and fluoroquinolones, rifampicin, fusidic acid or phosphomycin,
 - Enterobacteria resistant to nalidixic and fluoroquinolones,

Whether to maintain the combination must be discussed at treatment reassessment between hours 24 and 72. Except in rare cases, a combination should not normally be administered for more than 3 days.

► Cycling – Mixing

There is currently insufficient evidence to recommend the scheduling of regular substitution of one antibiotic by another that is not exposed to the same resistance mechanisms in a hospital department or entire hospital.

If bacterial resistance appears, a temporary restriction on the antibiotic(s) potentially responsible for the appearance of resistance may be part of a set of measures that include reinforcement of hygiene.

► Recommendations on surgical antibiotic prophylaxis

- Introduce written protocols that are readily accessible in the operating theatre. They should be drafted in liaison with anaesthetists, surgeons, microbiologists and pharmacists, and validated by CLIN⁶ and CAI⁷.
- Comply strictly with validated indications and protocols, and assess protocol application regularly,
- Comply with the rules of administration:

⁶ CLIN: *Comité de Lutte contre les Infections Nosocomiales* (Committee for the prevention of hospital infections)

⁷ CAI: *Commission des Anti-Infectieux* (Anti-infection Agents Committee)

- intravenous injection not more than 1 hr before the skin incision, in practice during induction of anaesthesia;
- loading dose amounting to twice the standard unit dose, and reinjection of one standard dose every two half-lives;
- duration usually limited to that of the operation, and not exceeding 24 hours.

The presence of drains or catheters does not justify prolonging antibiotic prophylaxis. There is no need to re-administer antibiotics on removal of drains or catheters.

Oral antibiotic prophylaxis must take account of the guidelines validated for each situation.

3. The role of hospital staff in the proper use of antibiotics

Many members of staff are concerned by the proper use of antibiotics; this requires cross-department organisation.

For an effective antibiotic policy, the hospital must deploy the necessary resources (human, equipment, IT resources). This can be done in a contractual context.

Apart from the organisation focusing on institutional players, three units must cooperate to ensure proper use: the microbiology laboratory, the pharmacy, and the clinical departments.

3.1 Institutional players

► The Committee for Medicinal Products and Sterile Medical Devices (COMEDIMS) and the CAI sub-committees

In accordance with regulatory provisions, COMEDIMS is responsible for:

- promoting and monitoring the proper use of medicinal products;
- conducting surveys on use and monitoring consumption;
- optimising expenditure on medicinal products;
- promoting medical research.

Sub-committees (the CAI - Anti-infection Agents (or Antibiotics) Committees) - are in charge of antibiotics policy⁸. All healthcare organisations should set up a CAI responsible for promoting and coordinating actions on the proper use of antibiotics in association with CLIN and COMEDIMS. The CAI meets at least 3 times a year.

CAI membership is based on competency in the field of antibiotic treatment and representativity, i.e. the specialties most concerned by the prescription of anti-infectives or the acquisition of bacterial resistance⁹. Other health practitioners besides clinicians who are competent in antibiotic treatment also sit on the committee (the pharmacist responsible for dispensing antibiotics, a biologist/microbiologist, and a member of the EOHH¹⁰). CLIN and COMEDIMS are represented on the committee.

If the volume of activity does not warrant setting up a CAI or if there are no practitioners qualified in antibiotic treatment, the hospital asks CLIN and COMEDIMS to study the possibility of internal or external cooperation (for instance with a health facility with a CAI).

CAI has a cross-department role in the healthcare organisation and the task of implementing best practices in antibiotic treatment in the clinical departments. It coordinates actions, especially high-priority actions, on the proper use of antibiotics in the healthcare organisation in liaison with COMEDIMS and CLIN. CAI must be consulted by COMEDIMS, and is responsible for drawing up and submitting substantiated, reasoned proposals to COMEDIMS.

⁸ Their roles are specified in circular DHOS/E2-DGS/SD5A no. 2002-272 of 2 May 2002.

⁹ Infectious diseases, intensive care, emergency medicine, onco-haematology, anaesthesia, surgery, internal medicine, pneumology, geriatrics, paediatrics, etc.

¹⁰ EOHH: *Equipe Opérationnelle en Hygiène Hospitalière* (operational team for hospital hygiene)

The CAI's main remit is as follows:

- validate the list of antibiotics that can be used in the hospital, and update it at least once a year;
- draw up a list of antibiotics subject to controlled distribution, and propose procedures for distribution; these procedures are included into the hospital's information system and validated by the CME¹¹/ *Conférence Médicale*;
- draft and/or validate and circulate guidelines forming the subject of a consensus by the healthcare providers concerned;
- take part in the drafting, introduction, and evaluation of antibiotic treatment protocols in the clinical departments. The CAI decides in which departments and situations the drafting of protocols is a priority, ensures that the protocols are drafted and updated, and validates the protocols jointly with the practitioners in the departments concerned;
- organise prescription audits with the clinical departments prescribing antibiotics; these audits must investigate compliance with validated local protocols and whether prescriptions are in line with microbiological data;
- coordinate, jointly with COMEDIMS, the regular distribution by the pharmacy of information relating to consumption, costs and new antibiotics approved;
- examine with CLIN whether antibiotic consumption is in line with the medical activities of facility and bacterial resistance.

The CAI submits an annual report of its actions to CME/ *Conférence Médicale*.

► **The antibiotics “advisor”**

Advisors are appointed to assist prescribers with the indication, choice and conduct of the best antibiotic treatment, and take part in training and evaluation activities.

The advisor is appointed by the Director of the healthcare organisation on the proposal of the CME. An advisor is a practitioner trained in antibiotic treatment. He or she should preferably have a post-graduate diploma in Infectious and Tropical Diseases, or failing this, either hold a university instructor's diploma in antibiotic treatment or have recognised expertise based on clinical experience and possibly scientific publications in the field. Recognition of expertise is important to ensure that advice is listened to.

The advisor is a member of the CAI. He/she

- promotes the best practices defined by the CAI, in close cooperation with the pharmacist(s), biologist(s) / microbiologist(s), and hygiene managers. This team can provide advice in their fields of competence; success depends on their synergy.
- advises on the proper use of antibiotics in the hospital whenever his/her opinion is solicited by prescribers. He/she acts as a consultant to the doctor in charge of the patient who is, however, ultimately responsible for the prescription. The advisor can also act on alerts from the CAI, pharmacy, biologist/microbiologist, or EOHH.
- organises staff training sessions on the proper use of antibiotics with his/her department representatives and the CAI (in particular, sessions for house officers at the start of each semester but also for paramedical staff).
- assists with best practice audits and clinical research in collaboration with the clinical departments, pharmacy, microbiology department, and hospital hygiene team.

The advisor works full-time or part-time for the hospital. There may be several advisors in large healthcare organisations. Grouping and operation in a network are encouraged for small healthcare facilities.

► **The local representative**

Each hospital department or activity sector must appoint one or more local representatives, who will be the CAI's contact to facilitate the implementation of best practices in antibiotic

¹¹ CME: *Commission médicale d'établissement* (Hospital Medical Committee)

treatment within the departments. This may be the person in charge of hygiene within the department or sector.

3.2 Microbiology laboratory

Each hospital must benefit from the services of a microbiology laboratory or at least of a qualified bacteriologist.

Internal and external quality control procedures should be performed on techniques for detecting bacterial resistance.

The laboratory must have a medical information management system that allows immediate delivery of microbiological results to the clinical departments, management of the patients' files, and epidemiological surveillance.

► Aid to diagnosis of infection, at the start of and during antibiotic treatment

The microbiology laboratory establishes with the departments concerned the nature and quality of all the microbiological samples required before initiation of empirical antibiotic treatment.

All organisational and technical measures which reduce the time from the collection of samples to the identification of bacteria and their sensitivity to antibiotics should be promoted, to help reduce the delay between sampling and administration of suitable antibiotic treatment.

The result of the antibiotic susceptibility profiles is given to practitioners after interpretation. In some cases, determination of the minimum inhibitory concentration may be useful to determine the doses required for satisfactory serum concentrations. The results may mention only some antibiotics (narrow susceptibility profiles) when there is an ongoing programme controlling antibiotic use. This restriction is proposed by the CAI and implemented in close liaison with the pharmacy, The results of tests of sensitivity to other antibiotics will be available on request.

The microbiology laboratory introduces procedures and resources which ensure that the results of the microbiological analyses are sent to clinical practitioners as soon as they are available.

► Epidemiological surveillance

Information on local ecology (global and by department) and on resistance of the main bacterial species to the main antibiotics considered as relevant indicators must be produced regularly (at least once a year). Indicators suitable for epidemiological surveillance must be produced, such as the number of methicillin-resistant *Staphylococcus aureus* (MRSA) isolates per 1000 days' hospitalisation.

The same indicators can be used for other resistant bacteria depending upon the local epidemiological situation (broad-spectrum betalactamase-producing Enterobacteria, ceftazidime-resistant *Pseudomonas aeruginosa*).

The epidemiological data should preferably be interpreted jointly with the EOHH¹² using the date of admission and the length of hospital stay to help identify cases contracted in or imported into a department or hospital. Compatible information management systems should be chosen.

All the information is sent to the CLIN¹³, CAI¹⁴ and clinical departments. The epidemiological data must be submitted to and interpreted by CAI and CLIN.

¹² EOHH: *Equipe Opérationnelle en Hygiène Hospitalière* (operational team for hospital hygiene)

¹³ CLIN: *Comité de Lutte contre les Infections Nosocomiales* (Committee for the prevention of hospital infections)

► Alert system

It is important to develop an operational alert system that warns clinical departments in the event of a particular resistance profile so that the necessary measures can be introduced (isolation, adaptation of antibiotic treatment). The microbiology laboratory must introduce measures for the early detection of an epidemic and of a new resistance phenotype.

All these actions are conducted in close liaison with the EOHH. All these tasks require computerised microbiology laboratories.

3.3 Pharmacy department

The tasks of hospital pharmacies in France regarding management of medicinal products are defined by law.¹⁵

► Management, procurement and stockage

The pharmacy buys and makes available to prescribers the antibiotics allowed by COMEDIMS¹⁶ in liaison with CLIN. It has a permanent stock of antibiotics defined as indispensable. It purchases products for occasional use at intervals compatible with patient safety. It guarantees continuity of treatment.

► Dispensing

Antibiotics administered systemically belong to the poisons register, and must be prescribed to a named patient. The pharmacist dispenses them after “pharmaceutical analysis of the prescription” (identification of the patient and the prescriber, dose and frequency of administration, etc.). In the case of antibiotics, pharmacists must have an information management system allowing them to ensure that the prescription conforms to CAI guidelines. In the event of non-conformity, the prescriber must be contacted, and the advisor’s opinion must be requested where necessary.

► Information

In liaison with COMEDIMS and CLIN, the pharmacy must supply and update the list of available antibiotics, best practice guidelines, and daily treatment costs. The prescriber must have access to some of this information especially when choosing an antibiotic (by means of explanatory prescriptions or reminders, for example).

► Evaluation

The hospital’s internal pharmacy is responsible for evaluation (pharmacoepidemiological, pharmaco-economic, and pharmacovigilance) and assistance with prescriptions¹⁷. Its tasks include evaluation of prescription practices and actions promoting proper antibiotic use.

The implementation of an information management system which allows monitoring and analysis of antibiotic consumption is a high-priority objective. It must regularly (at least annually) provide COMEDIMS, CLIN, CAI, CME, clinical departments and sectors with data:

- expressed not only in terms of costs, but also of defined daily doses (DDD/1000 days’ hospitalisation)¹⁸;
- distinguishing the main types of medical activity or centres of responsibility (especially intensive care, operating theatres, etc.).

The pharmacy’s information management system must also enable:

¹⁴ CAI: *Commission des Anti-Infectieux* (Anti-infection Agents Committee)

¹⁵ Law no. 92-1279 of 8 December 1992.

¹⁶ COMEDIMS: *Commission des Médicaments et des Dispositifs Médicaux Stériles* (Committee for Medicinal Products and Sterile Medical Devices)

¹⁷ Art. L 592-2 of Statute no. 92-1279 of 8 December 1992.

¹⁸ Circular DGS/DHOS/DSS/5A/E2/2006/139 of 23 March 2006

- pharmaceutical validation of prescriptions to a named person of all drugs, including antibiotics;
- the communication of any advice on quality of administration and treatment optimisation;
- the traceability of units not administered.

Hospital pharmacy departments should have the appropriate resources, especially IT and human resources (clinical pharmacists) to manage the information system, prescriptions, dispensing of antibiotics to named patients, and pharmaceutical advice.

3.4 Clinical departments

Guidelines for common clinical situations or involving the use of broad-spectrum antibiotics (especially the most recent products and/or those which should be kept on hold) need to be drafted. These guidelines must take the form of written protocols. Such protocols are essential in departments which are heavy users of antibiotics (such as surgery and haematology), units which have numerous prescribers (especially the accident and emergency department), departments with a high risk of bacterial resistance (intensive care, long- and medium-stay patients), and for topical antibiotics designed to prevent or treat colonisations. These protocols must be approved by the CAI¹⁹, and compliance with them must be assessed periodically

Drafting of specific protocols, implementation of general guidelines, analysis and assessment of surveillance data provided by the pharmacy and the microbiology laboratory, updating and dissemination of knowledge will be greatly facilitated and optimised by the appointment of local representatives in the clinical departments, and especially in the healthcare sectors most concerned by bacterial resistance.

The initial prescription and its reassessment must be entered in the patient's file. Information about the antibiotic treatment must be written in the patient's discharge letter.

The care team must ensure the actual administration, early administration, administration procedures, and traceability of the antibiotics prescribed.

The causes of treatment failures must be analysed.

4. Information and training

Information and training are essential for the proper use of antibiotics in hospitals.

► Interconnecting information produced by the microbiology laboratories, pharmacy and clinical departments

Relating all information allows for best patient management, monitoring of the incidence of resistance, and analysis of any exacerbating factors and their consequences.

Documents supplied by the microbiology laboratory and/or the pharmacy or in the information management system should preferably include information on daily treatment costs and usual doses. The CAI²⁰ must submit a summary of this information to the CME²¹ at least once a year, and ensure that regular information is delivered to all parties.

► Training programmes for healthcare providers

The programmes should

- promote initial and continuing training in epidemiology, surveillance, and methods of controlling bacterial resistance;

¹⁹ CAI: *Commission des Anit-Infectieux* (Anti-infection Agents Committee)

²⁰ CAI: *Commission des Anit-Infectieux* (Anti-infection Agents Committee)

²¹ CME: *Commission médicale d'établissement* (Hospital Medical Committee)

- provide information about local epidemiology and the hospital's antibiotic policy to each healthcare provider in the facility (especially on their arrival).

This training takes place at several levels:

- teaching of antibiotic prescription and bacterial resistance to medicine and pharmacy students and nurses, and to other professionals (e.g. administrators, nursing care managers);
- training of house officers at the start of each semester (could be combined with training on the prevention of hospital infections) and delivery of selected documents on that occasion;
- training of prescribers, focusing on their practices;
- suitable continuing medical education for the local representatives in the clinical departments;
- encouraging healthcare organisations to assess practices in order to ensure the efficacy of the training conducted;
- relaying within healthcare organisations (the role of CAI) national or regional campaigns to increase awareness of the proper use of antibiotics.

Drug manufacturers play an important part in providing information on antibiotics. COMEDIMS²² and CAI must ensure that this information complies with the medical sales representatives' charter, with national guidelines, and the hospital's actions. Different formulas can be used, in particular giving priority to meetings of CAI members to which representatives of the drug manufacturers concerned and of clinical departments are invited.

Implementation and communication of the results of investigations into antibiotic treatment practices, clinical audits, and monitoring of antibiotic consumption help to improve the quality of management of bacterial infections.

5. Looking ahead

These guidelines were drafted on the basis of current knowledge after a review of the literature and multidisciplinary meetings among health professionals. Many problems remain unsolved. In particular, the efficacy of certain strategies must be correctly assessed using rigorous and relevant protocols. The study of national antibiotic consumption and the impact of antibiotic policies, including alternating antibiotics, on bacterial resistance, and the early detection of new resistances should be a high priority.

National coordination of the institutional structures responsible for monitoring bacterial resistance, consumption, and the proper use of antibiotics should be encouraged. All healthcare professionals and institutions and professional societies concerned by the proper use of antibiotics must be coordinated and acquire the resources to introduce and follow a genuine antibiotic policy in the hospital.

Healthcare facilities must also acquire and exploit the existing tools which allow them to immediately implement a local antibiotic policy that takes account of existing guidelines and the local ecology. Harmonisation of these tools allows a relevant comparison and improved use of antibiotics at local, regional, national and international levels.

²² COMEDIS: *Commission des Médicaments et des Dispositifs Médicaux Stériles* (Committee for Medicinal Products and Sterile Medical Devices)

Working method

► Formal consensus method

Clinical practice guidelines are defined as “a systematically developed statement to assist practitioner and patient decisions about appropriate health care for one or more specific clinical circumstances.” The formal consensus (FC) method is one of the methods used by *Haute Autorité de Santé (HAS)* to draft clinical practice guidelines. It is based on a critical review of the available medical literature and on the opinion of a multidisciplinary group of health professionals involved in the chosen topic.

► Choice of topic

The topics of clinical practice guidelines are chosen by the HAS Board. This choice takes account of public health priorities and requests made by the Health and Social Security Ministers. The HAS Board may also address topics proposed by specialty societies, the National Cancer Institute, the National Union of Health Insurance Funds, the National Union of Healthcare Professionals, organisations representing healthcare professionals or healthcare organisations, and approved users’ associations.

The method includes the following participants and steps.

► Organising Committee (optional)

The Organising Committee, set up by HAS, consists of representatives of specialty societies, professional or users’ associations and, if applicable, the healthcare agencies and institutions concerned. The committee specifies the guideline topic, the questions to be covered, the target patient populations, and the professionals concerned. It draws attention to relevant documents, especially guidelines, that are already available. It puts forward the names of professionals who could act as members of the steering, rating, and peer-review groups. Members of the Organising Committee may also act as peer reviewers.

► Steering Committee

The Steering Committee, set up by HAS, consists of healthcare professionals working in the public or private sector, coming from different geographical areas and with different viewpoints. If required, other health professionals concerned by the topic and representatives of patients’ and users’ associations may also sit on the Committee. HAS designates a chair to coordinate the work of the group in liaison with the HAS Project Manager, and also the person who will be in charge of selecting, analysing and summarising the medical and scientific literature. This person assigns evidence levels for the studies included and drafts the evidence review of the guidelines, under the supervision of the HAS Project Manager and Committee Chair. The Steering Committee then draws up a list of proposed recommendations for submission to the Rating Committee.

► Rating Panel

The Rating Panel, set up by HAS, consists of professionals who routinely deal with the clinical situation under study. Members are selected according to the same criteria as for the Steering Committee. They each receive a questionnaire asking them to rate each proposal issued by the Steering Committee, using a 9-point numerical scale. Rating must take account of the evidence level available and of their practical experience (1st rating). A meeting of the members of the panel is then convened by the HAS Project Manager to discuss the results and weigh the members’ professional experience against the data in the literature. The proposals are amended or clarified, if necessary, and resubmitted to each panel member after the meeting for rating (2nd rating). Members who fail to return the questionnaire or to attend the meeting are excluded from the panel. The proposals, rating rules, individual rating results, and overall analysis are included as an appendix to the report.

► **Drafting of first version of the guidelines**

After the rating process, the HAS Project Manager prepares a first draft of the guidelines on the basis of the consensus reached. This draft is submitted to the Steering Committee, which checks its consistency before sending it out to the peer reviewers.

► **Peer reviewers (optional)**

Peer reviewers are selected by HAS using the same criteria as for the Rating Panel. They are consulted by post and give an opinion on the contents and format of the document, with special reference to the readability, applicability, and acceptability of the guidelines. The document is also peer reviewed by the HAS Committee for Health Strategy Assessment.

► **Final version of the guidelines**

The evidence review is amended or completed after a critical appraisal of any articles that may have been sent by peer reviewers. After analysis of their comments, the Steering Committee and Rating Panel jointly draft the final version of the guidelines (they may communicate by e-mail or attend a meeting convened by the HAS Project Manager and the Steering Committee Chair). If changes are made to the contents of the guidelines, the Rating Panel meets for a 3rd rating.

Soliciting the opinion of peer reviewers is not an absolute requirement of the HAS method. The guidelines drafted by the HAS Project Manager after the 2nd rating by the panel are submitted directly to the Steering Committee which checks their consistency.

The final version of the evidence review and guidelines, and the implementation process, are discussed by the HAS Committee for Healthcare Strategy Assessment. They may ask for revisions of the evidence review and guidelines. The Committee gives its opinion to the HAS Board.

► **Validation by the HAS Board**

On the proposal of the Committee for Healthcare Strategy Assessment, the HAS Board validates the final report and authorises its distribution.

► **Distribution**

HAS publishes the full text of the evidence review, the guidelines, and a summary online (free of charge on its website (www.has-sante.fr)). The summary and guidelines may be edited by HAS.

► **Work performed within HAS**

A HAS Project Manager ensures that all work complies with HAS' methodological principles and coordinates all steps. For each guideline topic,

- a systematic search of medical and scientific bibliographic databases is performed over a suitable time period (languages: English, French). Other specific databases may also be searched. This step always includes a search for clinical practice guidelines, consensus conferences, clinical decision articles, systematic reviews, meta-analyses, and other published national or international assessments;
- all useful websites (government agencies, specialty societies, etc.) are explored;
- documents not accessible through the usual information dissemination circuits (grey literature) are searched whenever possible;
- legal texts and regulations which may be relevant to the topic are also consulted;
- manual searching of citations in the articles analysed may provide additional information;
- Members of the Steering Committee, Rating Panel, and peer reviewers can send articles from their own bibliographic base.

The searches are performed as from the start of the project to build the evidence review and are then regularly updated until the end of the project.

Participants

Specialty societies and professional associations

The following learned societies and professional associations were asked to participate in compiling these guidelines:

- French Healthcare Products Safety Agency (AFSSAPS)
- French Urology Association (AFU)
- CTIN ILS
- French Federation of Medical Oncologists (FFOM);
- French-speaking Infectious Disease Society (Spilf);
- French-Speaking Pneumology Society (SPLF) ;
- French-Speaking Intensive Care Society (SRLF);
- French Society of Anaesthesia and Critical Care (SFAR);
- French Society of Orthopaedic and Trauma Surgery (Sofcot);
- French Society of Geriatrics and Gerontology (SFGG);
- French Microbiology Society (SFM);
- French Society of Paediatrics (SFP);
- French Haematology Society (SFH);
- French Hospital Hygiene Society (SFHH);
- French-speaking Emergency Medicine Society (SFMU);
- French Health Risk Management Society(Sofgres).

Steering Committee

Professor Alain Durocher, technical advisor to HAS, Saint-Denis;

Dr Véronique Vernet-Garnier, microbiologist, Rheims, project manager;

Professor Patrick Choutet, infectologist, Tours;

Dr Alain Lepape, CTIN ILS;

Dr Dominique Monnet, ECDC, Stockholm, Sweden;

Professor Olivier Mimos, anaesthetist and intensivist, Poitiers;

Dr Isabelle Pellanne, Afssaps, Saint-Denis;

Professor Michel Wolff, medical intensivist, Paris.

Rating Panel

Dr Jean Carlet, medical intensivist, Paris;

Dr Patrick Coloby, urology surgeon, Pontoise;

Professor Catherine Cordonnier, haematologist, Créteil;

Marie-Françoise Dumay, risk management, Paris;

Dr Bernard Durand-Gassel, geriatrician, Paris;

Professor Vincent Jarlier, microbiologist, Paris;

Professor Philippe Montravers, anaesthetist and intensivist, Paris;

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Synopsis

TITLE	Antibiotic therapy and prevention of bacterial resistance in healthcare organisations
Working method	Formal consensus
Publication date	Only available in electronic format
Objective(s)	To propose guidelines to help healthcare organisations implement effective strategies for antibiotic use and prevent bacterial resistance
Professional(s) concerned	Anaesthetists and intensivists, surgeons, geriatricians, haematologists, hygiene managers, infectologists, members of CLIN, oncologists, paediatricians, lung specialists, medical intensivists and emergency doctors.
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Project management	Coordination: Prof Alain Durocher, technical adviser, Best Professional Practices Department, HAS (Head of Department: Dr Patrice Dosquet) Secretarial services: Sladana Praizovic Document searches: Fanelli Gaëlle, with the aid of Julie Mokhbi, Documentation Department, HAS (Head of Department: Frédérique Pagès)
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Document Searches	January 1997 to December 2007
Authors of Evidence Review	Prof Alain Durocher, HAS Dr Véronique Vernet-Garnier, microbiologist, Rheims
Validation	Opinion of the Health Strategies Assessment Committee Validated by the HAS Board on 16 April 2008
Other formats	Can be downloaded free of charge from www.has-sante.fr